UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/784,192	02/24/2004	Sang-Hwan Cho	1568.1072	1088

49455 7590 09/07/2005

STEIN, MCEWEN & BUI, LLP
1400 EYE STREET, NW
SUITE 300
WASHINGTON, DC 20005

EXAMINER	
RAABE, CHRISTOPHER M	
ART UNIT	**PAPER NUMBER**
2879	

DATE MAILED: 09/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/784,192	CHO ET AL.	
	Examiner	Art Unit	
	Christopher M. Raabe	2879	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-46* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-46* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 February 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *2/24/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Amendment filed July 20, 2004 has been entered and acknowledged by the examiner.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

2. Claims 1-3,6-8,18,19,37,44,46,31,32,35,36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hori et al. (US Patent 6392338), in view of Takahashi et al. (US Patent 5804917).

With regard to claim 1,

Hori et al. disclose an organic electroluminescence (EL) display device assembly comprising: a substrate (91 of fig 10); an organic EL portion having a first electrode layer (95 of fig 10), an organic luminescent layer (94 of fig 10), and a second electrode layer (926 of fig 10),

which are each patterned and stacked proximate to an upper surface of the substrate (fig 10); and an optical loss prevention layer to increase light bleeding efficiency (97 of fig 10).

Hori does not disclose a fine space layer being formed.

Takahashi et al. do disclose a fine space layer being formed and filled with a gas or evacuated (figs 1,2).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the fine space layer of Takahashi et al. into the display device assembly of Hori et al. in order to reduce likelihood of damage to EL portion layer during manufacture.

With regard to claim 2,

Hori et al. disclose the organic EL display device assembly, wherein the optical loss prevention layer is a diffraction grating having a plurality of protrusions formed on the upper surface of the substrate with a predetermined pitch between adjacent protrusions (97A of fig 10, and 87 of fig 9).

With regard to claim 3,

Hori et al. disclose the organic EL display device assembly, wherein the protrusions contact the second electrode layer (87, 826 of fig 9).

With regard to claim 6,

Hori et al. disclose the organic EL display device assembly, wherein the second electrode layer is formed of indium tin oxide (ITO) (926 of fig 10, and column 18).

With regard to claim 7,

Hori et al. disclose the organic EL display device assembly, wherein the optical loss prevention layer is formed of at least one material selected from the group consisting of SiO_x (x>1), SiN_x, Si_3N_4, TiO_2, MgO, ZnO, Al_2O_3, SnO_2, In_2O_3, MgF_2, CaF_2 (column15, lines 50-55).

With regard to claim 8,

Hori et al. disclose the organic EL display device assembly, wherein the optical loss prevention layer is formed of TiO_2 (column 15, lines 50-55).

With regard to claim 18,

Hori et al. disclose the organic EL display device assembly, wherein the diffraction grating (should read "optical loss prevention layer" – lack of antecedent for "diffraction grating" in claim 1) is formed of at least one material selected from the group consisting of SiO_x (x>1), SiN_x, Si_3N_4, TiO_2, MgO, ZnO, Al_2O_3, SnO_2, In_2O_3, MgF_2, and CaF_2 (column 15, lines 50-55).

With regard to claim 19,

Hori et al. disclose the organic EL display device assembly, wherein the optical loss prevention layer is formed of TiO_2 (column 15, lines 50-55).

With regard to claim 37,

Hori et al. disclose the organic EL display device assembly, wherein the optical loss prevention layer is formed of SiO_x (x>1) and TiO_2 which have different refractive indices (column 15, lines 50-55).

With regard to claim 44,

Hori et al. the organic electroluminescence (EL) display device assembly, wherein the optical loss prevention layer comprises a patterned thin film having at least two materials with different refractive indices (column 15, lines 50-55).

With regard to claim 46,

Hori et al. disclose the organic EL display device assembly, wherein the optical loss prevention layer is formed of SiO_x (x>1) and TiO_2 which have different refractive indices (column 15, lines 50-55).

With regard to claim 31,

Hori et al. disclose an organic EL display device assembly comprising: a substrate (71 of fig 8); a first electrode layer (726 of fig 8), an organic luminescent layer (74 of fig 8), and a second electrode layer sequentially stacked proximate to an upper surface of the substrate (75 of fig 8); and an optical loss prevention layer having a substantially different refractive index from a refractive index among the first electrode layer, the organic luminescent layer, and the second electrode layer, and being formed between the first electrode layer and the substrate (77 of fig 8).

Hori et al. do not disclose a fine space layer.

Takahashi et al. do disclose a fine space layer being formed and filled with a gas or evacuated (figs 1,2).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the fine space layer of Takahashi et al. into the display device assembly of Hori et al. in order to reduce likelihood of damage to EL portion layer during manufacture.

With regard to claim 32,

Hori et al. disclose the organic EL display device assembly, wherein the optical loss prevention layer is a patterned thin film (77 of fig 8).

With regard to claim 35,

Hori et al. disclose the organic EL display device assembly, wherein the optical loss prevention layer is formed of inorganic materials with refractive indices that differ by an amount in a range of 0.3 to 3 (column 15, lines 50-55).

With regard to claim 36,

Hori et al. disclose the organic EL display device assembly, wherein the inorganic materials are at least two materials selected from the group consisting of SiO_x ($x<1$), SiN_x, Si_3N_4, TiO_2, MgO, ZnO, Al_2O_3, SnO_2, In_2O_3, MgF_2, and CaF_2 (column 15, lines 50-55).

3. Claims 4,33,43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hori et al. and Takahashi et al. as applied to claims 2, 31, 32 above, and further in view of Hosokawa et al. (US Patent 5307363).

With regard to claim 4,

Hori et al. disclose the organic EL display device assembly.

Hori et al. do not disclose the pitch between adjacent protrusions.

Hosokawa et al. do disclose the pitch between adjacent protrusions, and disclose the pitch to be 200 nm to 2000 nm (7 of fig 6).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the pitch disclosed by Hosokawa et al. into the display device assembly of Hori et al. in order increase the amount of light emitted from the device.

With regard to claim 33,

Hori et al. disclose the organic EL display device assembly, wherein the optical loss prevention layer comprises at least two area groups having different refractive indices (column 15, lines 50-55).

Hori et al. do not disclose a pitch between adjacent areas in one of the two area groups with different refractive indices of the optical loss prevention layer to be 50 nm to 3000 nm.

Hosokawa et al. do disclose a pitch between adjacent areas in one of two area groups with different refractive indices of an optical loss prevention layer to be 50 nm to 3000 nm (7 of fig 6).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the pitch disclosed by Hosokawa et al. into the display device assembly of Hori et al. in order increase the amount of light emitted from the device.

With regard to claim 43,

Hori et al. disclose the organic EL display device assembly.

Hori et al. do not disclose a pitch between adjacent areas in one of the two area groups with different refractive indices of the optical loss prevention layer to be 50 nm to 3000 nm.

Hosokawa et al. do disclose a pitch between adjacent areas in one of two area groups with different refractive indices of an optical loss prevention layer to be 50 nm to 3000 nm (7 of fig 6).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the pitch disclosed by Hosokawa et al. into the display device assembly of Hori et al. in order increase the amount of light emitted from the device.

4. Claims 5,34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hori et al., Takahashi et al. and Hosokawa et al. as applied to claims 3,4 above, and further in view of Kawase (US Pre-grant Publication 2001/0033136).

With regard to claim 5,

Hori et al. disclose the organic EL display device assembly.

Hori et al. does not disclose the height of the height of each of the protrusions.

Kawase does disclose the height of each of the protrusions, and disclose the height to be 50 nm to 5000 nm (paragraph 36).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the height disclosed by Kawase into the display device assembly of Hori et al. in order to increase the amount of light emitted from the device.

With regard to claim 34,

Hori et al. disclose the organic EL display device assembly.

Hori et al. do not disclose the thickness of the optical loss prevention layer to be 0.01 μm to 50 μm.

Kawase does disclose the thickness of the optical loss prevention layer to be 0.01 μm to 50 μm (paragraph 36).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the height disclosed by Kawase into the display device assembly of Hori et al. in order to increase the amount of light emitted from the device.

5. Claims 9-11,21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hori et al. and Takahashi et al. as applied to claim 1 above, and further in view of Burrows et al. (US Patent 6013538).

With regard to claim 9,

Hori et al. disclose the organic EL display device assembly.

Hori et al. do not disclose an index layer with a substantial refractive index formed between the fine space layer and the second electrode layer.

Takahashi does disclose a layer adjacent to a second electrode layer, opposite the organic layer, formed between a fine space layer and the second electrode layer (column 8, lines 1-5).

Burrows et al. do disclose an index layer with a substantial refractive index formed adjacent to the second electrode, opposite the organic layer (180 of fig 9).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the fine space layer of Takahashi et al. and the index layer of Burrows et al. into the display device assembly of Hori et al. in order to increase the amount of light emitted from the device.

With regard to claim 10,

Hori et al. disclose the organic EL display device assembly.

Hori et al. do not disclose an index layer.

Burrows et al. do disclose an index layer, and the index layer being formed of TiO_2 (column 12).

Utilizing the reasoning in the rejection of claim 9, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the index layer of Burrows et al. into the display device assembly of Hori et al.

With regard to claim 11,

Hori et al. disclose the organic EL display device assembly.

Hori et al. do not disclose an index layer.

Burrows et al. do disclose an index layer, and the refractive index of the index layer to be greater than or equal to 2.3 (column 12).

Utilizing the reasoning in the rejection of claim 9, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the index layer of Burrows et al. into the display device assembly of Hori et al.

With regard to claim 21,

Claim 21 is rejected for not further limiting the subject matter, as claim 21 reads: "The organic EL display device assembly of claim 9, wherein the refractive index of the index layer is greater than or equal to 2.3," which is identical to claim 11.

6. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hori et al., Takahashi et al. and Burrows et al. as applied to claim 9 above, and further in view of Murasko et al. (US Pre-grant Publication 2003/0015962).

With regard to claim 12,

Hori et al. disclose the organic EL display device assembly.

Hori et al. do not disclose an index layer.

Murasko et al. do disclose an index layer, and the thickness of the index layer to be greater than or equal to 2000 nm (paragraph 31).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the index layer disclosed by Murasko et al. into the display device assembly of Hori et al. in order to increase the amount of light emitted from the device.

7. Claims 13-15,17,45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hori et al. (as above), in view of Takahashi et al. (as above) and Kawase (as above).

With regard to claim 13,

Hori et al. disclose an organic EL display device assembly comprising: a substrate (91 of fig 10); an organic EL display portion having a first electrode layer (95 of fig 10), an organic luminescent layer (94 of fig 10), and a second electrode layer (926 of fig 10), which are each patterned and stacked on an upper surface of the substrate (fig 10).

Hori et al. do not disclose a photonic plate or a fine space layer.

Kawase does disclose a photonic plate which has an optical loss prevention layer (paragraph 45).

Takahashi et al. do disclose forming a fine space layer by combining a plate with an organic EL display portion (figs 1,2)

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the photonic plate of Kawase and the fine space layer of Takahashi et al. into the display device assembly of Hori et al. in order to control the wavelength of light emitted by the device and reduce the potential for damage to the EL portion during manufacture.

With regard to claim 14,

Hori et al. disclose the organic EL display device assembly, wherein the optical loss prevention layer has a plurality of protrusions formed on the upper surface of the substrate with a predetermined pitch between adjacent protrusions (97a of fig 10, and 87 of fig 9).

With regard to claim 15,

Hori et al. disclose the organic EL display device assembly, wherein the protrusions contact the second electrode layer (87, 826 of fig 9).

With regard to claim 17,

Hori et al. disclose the organic EL display device assembly.

Hori et al. does not disclose the height of the height of each of the protrusions.

Kawase does disclose the height of each of the protrusions, and disclose the height to be 50 nm to 5000 nm (paragraph 36).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the height disclosed by Kawase into the display device assembly of Hori et al. in order to increase the amount of light emitted from the device.

With regard to claim 45,

Hori et al. disclose an organic electroluminescence (EL) display device assembly comprising: a substrate (91 of fig 10); an organic EL portion having a first electrode layer (95 of fig 10), an organic luminescent layer (94 of fig 10), a second electrode layer (926 of fig 10), which are each patterned and stacked on an upper surface of the substrate (fig 10).

Hori et al. do not disclose a photonic plate or a fine space layer.

Kawase does disclose first and second photonic plates which have an optical loss prevention layer (paragraph 45).

Takahashi et al. do disclose forming a fine space layer by combining a plate with an organic EL display portion (figs 1,2)

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the photonic plate of Kawase and the fine space layer of Takahashi et al. into the display device assembly of Hori et al. in order to control the wavelength of light emitted by the device and reduce the potential for damage to the EL portion during manufacture.

8. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hori et al., Takahashi et al, and Kawase as applied to claim 14 above, and further in view of Hosokawa (as above).

With regard to claim 16,

Hori et al. disclose the organic EL display device assembly.

Hori et al. do not disclose the pitch between adjacent protrusions.

Hosokawa et al. do disclose the pitch between adjacent protrusions, and disclose the pitch to be 200 nm to 2000 nm (7 of fig 6).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the pitch disclosed by Hosokawa et al. into the display device assembly of Hori et al. in order increase the amount of light emitted from the device.

9. Claims 20,30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hori et al., Takahashi et al., and Kawase as applied to claim 13 above, and further in view of Burrows et al (as above).

With regard to claim 20,

Hori et al. disclose the organic EL display device assembly.

Hori et al. do not disclose an index layer with a substantial refractive index formed between the fine space layer and the second electrode layer.

Takahashi does disclose a layer adjacent to a second electrode layer, opposite the organic layer, formed between a fine space layer and the second electrode layer (column 8, lines 1-5).

Burrows et al. do disclose an index layer with a substantial refractive index formed adjacent to the second electrode, opposite the organic layer (180 of fig 9).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the fine space layer of Takahashi et al. and the index layer of Burrows et al. into the display device assembly of Hori et al. in order to increase the amount of light emitted from the device.

With regard to claim 30,

Hori et al. disclose the organic EL display device assembly.

Hori et al. do not disclose an index layer.

Burrows et al. do disclose an index layer, and the refractive index of the index layer to be greater than or equal to 2.3 (column 12).

Utilizing the reasoning in the rejection of claim 20, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the index layer of Burrows et al. into the display device assembly of Hori et al.

10. Claims 22-25,27,28,38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hori et al. (as above), in view of Kawase (as above), Takahashi et al. (as above), and Koyama (US Pre-grant Publication 2001/0002703).

With regard to claim 22,

Hori et al. disclose an organic EL display device assembly comprising: a substrate (91 of fig 10); an organic EL display portion having a first electrode layer (95 of fig 10), an organic luminescent layer (94 of fig 10), and a second electrode layer (926 of fig 10), which are each patterned and stacked on an upper surface of the substrate (fig 10).

Hori et al. do not disclose a photonic plate, thin film transistors, an insulating layer formed to expose the organic layer, or a fine space layer.

Kawase does disclose a photonic plate which has an optical loss prevention layer (paragraph 45).

Takahashi et al. do disclose forming a fine space layer with an inert gas or evacuated by combining a plate with an organic EL display portion (figs 1,2).

Koyama do disclose an insulating layer formed on an upper surface of the substrate to expose and organic EL layer (44a,b of fig 11) and a driving portion formed on a substrate and having thin film transistors to switch a first electrode layer (fig 11).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the photonic plate of Kawase, the fine space layer of Takahashi et al., and the insulating layer and thin film transistors of Koyama into the display device assembly of Hori et al. in order to control the wavelength of light emitted by the device, reduce the potential for damage to the EL portion during manufacture, and define and control display pixels.

With regard to claim 23,

Hori et al. disclose the organic EL display device assembly.

Hori et al. do not disclose the use of a planarization film.

Koyama does disclose the use of a planarization film (42 of fig 11).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the use of a planarization film, disclosed by Koyama, into the display device assembly of Hori et al. in order to increase light emitting efficiency.

With regard to claim 24,

Hori et al. disclose the organic EL display device assembly, wherein the optical loss prevention layer has a plurality of protrusions formed on the upper surface of the substrate with a predetermined pitch between adjacent protrusions (97a of fig 10, and 87 of fig 9).

With regard to claim 25,

Hori et al. disclose the organic EL display device assembly, wherein the protrusions contact the second electrode layer (87, 826 of fig 9).

With regard to claim 27,

Hori et al. disclose the organic EL display device assembly.

Hori et al. does not disclose the height of the height of each of the protrusions.

Kawase does disclose the height of each of the protrusions, and disclose the height to be 50 nm to 5000 nm (paragraph 36).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the height disclosed by Kawase into the display device assembly of Hori et al. in order to increase the amount of light emitted from the device.

With regard to claim 28,

Hori et al. disclose the organic EL display device assembly, wherein the diffraction grating (should read "optical loss prevention layer" – lack of antecedent for "diffraction grating in claim 23) is formed of at least one material selected from the group consisting of SiO_x (x>1), SiN_x, Si_3N_4, TiO_2, MgO, ZnO, Al_2O_3, SnO_2, In_2O_3, MgF_2, and CaF_2. (column 15, lines 50-55).

With regard to claim 38,

Hori et al. disclose an organic EL display device assembly comprising: a substrate (71 of fig 8); a pixel portion having a first electrode layer patterned on the substrate (726 of fig 8), an organic luminescent layer patterned on an upper surface of the first electrode layer (74 of fig 8), an insulating layer formed on an upper surface of the substrate to expose an organic luminescent layer, and a second electrode layer which is transparent and patterned on an

upper surface of the organic luminescent layer (75 of fig 8) and an optical loss prevention layer having patterned areas with different refractive indices (77 of fig 8).

Hori et al. do not disclose a photonic plate, thin film transistors, an insulating layer formed to expose the organic layer, or a fine space layer.

Kawase does disclose a photonic plate which has an optical loss prevention layer (paragraph 45).

Takahashi et al. do disclose forming a fine space layer with an inert gas or evacuated by combining a plate with an organic EL display portion (figs 1,2).

Koyama do disclose an insulating layer formed on an upper surface of the substrate to expose and organic EL layer (44a,b of fig 11) and a driving portion formed on a substrate and having thin film transistors to switch a first electrode layer (fig 11).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the photonic plate of Kawase, the fine space layer of Takahashi et al., and the insulating layer and thin film transistors of Koyama into the display device assembly of Hori et al. in order to control the wavelength of light emitted by the device, reduce the potential for damage to the EL portion during manufacture, and define and control display pixels.

11. Claims 26,39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hori et al., Takahashi et al., Kawase, and Koyama as applied to claims 24,38 above, and further in view of Hosokawa (as above).

With regard to claim 26,

Hori et al. disclose the organic EL display device assembly.

Hori et al. do not disclose the pitch between adjacent protrusions.

Hosokawa et al. do disclose the pitch between adjacent protrusions, and disclose the pitch to be 200 nm to 2000 nm (7 of fig 6).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the pitch disclosed by Hosokawa et al. into the display device assembly of Hori et al. in order increase the amount of light emitted from the device.

With regard to claim 39,

Hori et al. disclose the organic EL display device assembly.

Hori et al. do not disclose a pitch of one of the two patterned areas with different refractive indices of the optical loss prevention layer to be 50 nm to 3000 nm.

Hosokawa et al. do disclose a pitch of one of two patterned areas with different refractive indices of an optical loss prevention layer to be 50 nm to 3000 nm (7 of fig 6).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the pitch disclosed by Hosokawa et al. into the display device assembly of Hori et al. in order increase the amount of light emitted from the device.

12. Claims 29, 40-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hori et al., Takahashi et al., Kawase, and Koyama as applied to claims 23,38 above, and further in view of Burrows et al. (as above).

With regard to claim 29,

Hori et al. disclose the organic EL display device assembly.

Hori et al. do not disclose an index layer with a substantial refractive index formed between the fine space layer and the second electrode layer.

Takahashi does disclose a layer adjacent to a second electrode layer, opposite the organic layer, formed between a fine space layer and the second electrode layer (column 8, lines 1-5).

Burrows et al. do disclose an index layer with a substantial refractive index formed adjacent to the second electrode, opposite the organic layer (180 of fig 9).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the fine space layer of Takahashi et al. and the index layer of Burrows et al. into the display device assembly of Hori et al. in order to increase the amount of light emitted from the device.

With regard to claim 40,

Hori et al. disclose the organic EL display device assembly.

Hori et al. do not disclose an index layer with a substantial refractive index formed between the fine space layer and the second electrode layer.

Takahashi does disclose a layer adjacent to a second electrode layer, opposite the organic layer, formed between a fine space layer and the second electrode layer (column 8, lines 1-5).

Burrows et al. do disclose an index layer with a substantial refractive index formed adjacent to the second electrode, opposite the organic layer (180 of fig 9).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the fine space layer of Takahashi et al. and the index layer of Burrows et al. into the display device assembly of Hori et al. in order to increase the amount of light emitted from the device.

With regard to claim 41,

Hori et al. disclose the organic EL display device assembly.

Hori et al. do not disclose an index layer.

Burrows et al. do disclose an index layer, and the refractive index of the index layer to be greater than or equal to 2.3 (column 12).

Utilizing the reasoning in the rejection of claim 40, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the index layer of Burrows et al. into the display device assembly of Hori et al.

With regard to claim 42,

Hori et al. disclose the organic EL display device assembly.

Hori et al. do not disclose a planarization film.

Koyama do disclose a planarization film formed on the upper surface of a first electrode layer (4026 of fig 9b).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the planarization film of Koyama into the display device assembly of Hori et al. in order to increase light emitting efficiency.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US Patents 5013141, 5874803, 5940568, 5994835, US Pre-grant Publications 2003/0164496, 2003/0071566.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher M. Raabe whose telephone number is 571-272-8434. The examiner can normally be reached on m-f 7am-3:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on 571-272-2457. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CR

ASHOK PATEL
PRIMARY EXAMINER